In the Claims

The following listing of claims will replace all previous listings of claims in the Application:

1. (Currently Amended) A method of performing quantum key distribution (QKD) with weak optical pulses, comprising:
   a) generating a random set of key bits k_1, k_2, ...ki...kn;
   b) encrypting the key bits; and
   c) using the encrypted key bits to form encrypted qubits from the optical pulses without first forming unencrypted qubits from the optical pulses.

2. (Original) The method of claim 1, including:
   encrypting the key bits using a stream cipher.

3. (Previously Amended) The method of claim 2, wherein the stream cipher uses a password formed from a fraction of a QKD key.

4. (Previously Amended) The method of claim 2, including decoding the encrypted qubits using the stream cipher.

5. (Presently Amended) A method of performing quantum key distribution (QKD) using weak optical pulses, comprising:
   at a first QKD station:
   a) generating a random set of key bits;
   b) generating a pad using a stream cipher;
   c) XOR-ing the key bits and the pad to obtain encrypted key bits: and
   d) modulating the weak optical pulses using the encrypted key bits so as to simultaneously ~~generate~~ encoded and encrypt the optical pulses to form encrypted qubits .

6. (Original) The method of claim 5, further comprising at a second QKD station optically coupled to the first QKD station:

a) measuring the encrypted qubits using a random basis; and

b) recovering at least a subset of the key bits from the measured encrypted qubits by XOR-ing the measured encrypted qubits with the pad.

7. (Original) The method of claim 6, further including:

establishing a sifted key between the first and second QKD stations based on the key bits generated in the first QKD station and the key bits recovered in the second QKD station.

8. (Presently Amended) A QKD system, comprising:

a) a first QKD station having:

a. an optical radiation source adapted to emit weak optical pulses of radiation;

b. a first random number generator adapted to generate random numbers for use as first key bits;

c. a first e/d module coupled to the first random number generator to encrypt the key bits thereby forming encrypted key bits;

d. a modulator arranged to receive the weak optical pulses and adapted to modulate the polarization or phase of the weak optical pulses based on the encrypted key bits to form encrypted qubits <u>without having to first form unencrypted qubits</u>;

b) a second QKD station optically coupled to the first QKD station and having:

a. a second modulator adapted to receive and ~~b.~~ randomly polarization-modulate or phase-modulate the encrypted qubits;

b. a detector for detecting the modulated encrypted qubits; and

c. a second e/d module coupled to the detector and adapted to recover from the modulated encrypted qubits second key bits corresponding to the first key bits.

9. (Presently Amended) A quantum cryptography system, comprising:

a) a quantum key distribution (QKD) system that utilizes key bits and basis bits to encode weak optical pulses ~~to form qubits~~; and

b) a classical encryption system operably coupled to the QKD system and adapted to encode at least one of the key bits and the basis bits to form encrypted qubits from the weak optical pulses without first forming unencrypted qubits.

10. (New) The quantum cryptography system according to claim 10, wherein the classical encryption system includes an encryption/decryption (e/d) module configured to perform XOR-ing of the key bits and a password to form encrypted key bits.

11. (New) The quantum cryptography system according to claim 8, wherein the classical encryption system is adapted to generate the password using a stream cipher.

12. (New) The quantum cryptography system of claim 10, further including a phase modulator operably coupled to the classical encryption system and configured to impart a phase to each weak optical pulse based on one of said encrypted key bits.

13. (New) The quantum cryptography system of claim 12, wherein the basis bits are encoded, and wherein the phase modulator is configured to encode each weak optical pulse with one of the encoded basis bits.